GREEN COMMUNITIES DESIGNATION PROGRAM

Energy Use Baseline

Criteria 3

Energy Reduction Plan (ERP) Guidance and Outline

INTRODUCTION

Criterion Three for Green Communities Designation requires that a municipality (including both the general government and school district):

(1) **Establish an energy use baseline.** This inventory must include all divisions and departments including: all municipal buildings, school buildings, municipal and school vehicles, street and traffic lighting, drinking water and wastewater treatment plants, pumping stations and open spaces[1] owned by the municipality.

- Divisions and departments operating as Enterprise Funds under MGL Chapter 44, Section 53F ½ where such services are provided by a third party contractor or where the sole operating and budget authority resides with a board or commission) may be excluded from the Energy Reduction Plan. However, these operations are encouraged to become a part of and to adopt the Energy Reduction Plan. The exclusion does not apply to any other existing or future division or department operating as an Enterprise Fund for which the City has direct authority over its operation.

- If a municipality pays the energy bills for an asset it does not own, it may elect to include that asset in its baseline if it would like to claim credit for any of that asset's energy reductions. For example, towns frequently pay the energy bills for streetlights owned by their utility or for buildings owned by a historical society. Please explicitly state if you are electing to include an asset the municipality does not own.

- The energy use baseline inventory should be provided on an MMBtu (Million British Thermal Units) basis. There are a number of acceptable tools for performing the inventory including:
    a. DOER's MassEnergyInsight (MEI) (www.massenergyinsight.net)[2]
    b. Energy Star Portfolio Manager
    b. ICLEI software
    d. Other tools proposed by the municipality and deemed acceptable by DOER

- The baseline year should consist of the most recent year of complete data. For applications in the fall of 2016, this should be Fiscal Year 2016 (or Calendar Year 2015). However, to allow communities to take credit for energy efficiency measures completed in recent years, a municipality may provide a baseline that goes back as far as FY 2014 (or CY 2014), and provide a reduction plan that begins in FY 2015 (or CY 2015). Already completed measures should be documented as described in Section IV B 5.

- For applications consisting of more than one municipality, each municipality must complete the inventory. However, the comprehensive program to reduce the baseline by 20% can be applied across all communities.

[1] The "Open Space" category includes energy use by parking lots, parks, cemeteries and athletic fields.

[2] Preferred method

(2) Put in place a comprehensive program designed to reduce this baseline by 20% within the 5 year period following the Baseline Year. The 20% reduction is applied to the aggregate energy use (in MMBtus) in the baseline energy use inventory. Please note that the 5 year time period begins the year following the baseline year, not the year following designation as a Green Community. It is DOER's intent to permit Green Communities that have installed energy conservation measures in their fifth year to achieve the full energy savings from these Year 5 measures. To ensure this, DOER allows communities to wait a full year after Year 5 has been completed before assessing their progress towards the 20% energy reduction commitment. Effectively, this means that some communities will achieve their 20% reduction after Year 6 and still be considered to have met their designation commitment. For example, applicants using a 2014 baseline work to reduce their energy use from 2015 through 2019. They then should achieve their 20% energy reduction by the end of 2019, unless they have installed energy conservation measures in 2019, in which case they should achieve their total energy use by 20% by the end of 2020.

a. Create an Energy Reduction Plan (ERP) to document both the baseline energy consumption and the comprehensive program to reduce total energy use by 20%. An ERP is a document that requires thoughtful planning and participation by all municipal departments, including schools. Municipalities should plan on at least three months to complete the process of producing an ERP. A team of individuals and a designated lead responsible for conducting the baseline inventory and developing the ERP should be identified. The process will involve collecting data using one of the tools identified above, analyzing the data to understand where reductions can be achieved, setting goals and developing strategies based on data collection and analysis, and finally developing and writing the ERP.

A well-prepared ERP will provide a realistic path for implementation. The benefits of ERP implementation include long-term savings in annual energy costs and reductions in a municipality's greenhouse gas emissions. It also presents an opportunity to perpetuate these benefits if a portion of the cost savings is re-invested in further energy efficiency. Finally, the ERP is an opportunity to engage the community in municipal energy reduction, both in its design and implementation and in publicizing its successes.

b. **Report annually on the ERP and assess progress towards the 20% energy reduction.** If, at the end of 5-6 years, a municipality has not reduced its energy consumption by 20%, it will be asked to provide a revised plan to fulfill its ERP. If the municipality cannot effectively demonstrate significant efforts to reduce its energy consumption by 20%, then the municipality is at risk of losing its Green Community designation. A municipality will not lose its previously-awarded grant funding as a result of not meeting its 20% energy reduction goal.

INSTRUCTIONS FOR CREATING AN ENERGY REDUCTION PLAN

A comprehensive ERP consists of a number of key components which enables a municipality to establish energy reduction goals and develop a structure to meet those goals over a specific period of time. The outline below presents the format for the ERP and addresses its key components. *The information contained in the outline below is the* ***minimum*** *information that a municipality is expected to provide in its ERP.* Please use the sample tables provided in this document and also in a separate excel file, but note that it is important to also provide a brief supporting narrative.

ENERGY REDUCTION ACTION PLAN OUTLINE

I. PURPOSE AND ACKNOWLEDGEMENTS

A. Letters from Both General Government and School District Verifying Adoption of the ERP

- **General Government** – The general government must provide a letter from the Chief Executive Officer of the city or town stating that it has adopted the Energy Reduction Plan. The Chief Executive Officer is defined as the manager in any city having a manager and in any town having a city form of government, the Mayor in any other city, and the Board of Selectmen in any other town unless some other officer or body is designated to perform the functions of a Chief Executive Officer under the provisions of a local charter or laws having the force of a charter. See sample letter in Appendix A.

- **Public School Districts** - For a municipality to meet this requirement, its public school district must be included in the municipality's baseline. Furthermore, the public school district must provide a letter from the Superintendent of Schools stating that is has adopted the Energy Reduction Plan.

- **Regional School Districts** – Regional School Districts are not required to be part of a municipality's Green Communities designation application. However, for regional school districts that wish to be part of a municipality's Green Communities designation (with approval by the municipality), the regional school district must establish an energy use baseline and assign the appropriate percentage of that baseline to the municipality (based on the funding assessment percentage that municipality contributes annually to the regional school district). The regional school district must also adopt the Energy Reduction Plan. A municipality may also include its local elementary school that is part of a RSD, but not include its portion of the middle/high school. In this case, 100% of the elementary school's energy use would be included in the Energy Reduction Plan. See Appendix B for details.

B. List of Contributors that Participated in the Baseline and ERP Process

II. EXECUTIVE SUMMARY

A. ***Narrative Summary of the Town*** - including population and any special school accreditations, Energy Star© ratings, EPA Community Energy Challenge participant, ICLEI community, etc.

B. ***Summary of Municipal Energy Uses*** - use instructions below to create Table 1 (sample below). Reiterating the Table 1 contents in text is not required.

- *Total Number of Municipal Buildings* - including schools, and broken down by type of heating fuel (e.g. oil, propane, natural gas, etc.). For Regional School Districts wishing to be included in the municipality's Green Communities designation, please list the number of their buildings (by fuel type) and vehicles (by exempt category) as separate lines and list "RSD" in the ownership column.
- *Building Additions and New Construction* - Please identify any building additions or new construction planned for completion during the 5-year ERP period. Due to the unique nature of many building projects, a community MUST consult with DOER regarding building stock changes prior to submission of its Green Communities application. For general guidance, please see Building Stock Changes Guidance in Appendix C.
- *Total Number of Vehicles* - including schools, and broken down by number of exempt and non-exempt vehicles as defined by Green Communities Criterion 4.

- *Total Number of Street Lights and Traffic Lights* – Please list the number of street and traffic light owned by the municipality or by the utility in separate rows with a note in the ownership column. If owned by the utility, then these will not be included in the baseline and Energy Reduction Plan unless the municipality explicitly states they wish to include them.
- *Water and Sewer* – Note the number of drinking and wastewater treatment plants and pumping stations owned by the municipality.

Table 1: Summary of Municipal Energy Users (Sample Data)

	Number	Ownership
Buildings		
Oil Heat	5	Muni
Oil Heat	3	RSD
Natural Gas Heat	0	
Propane Heat	4	Muni
Biomass Heat	0	
Other Heat Type	0	
Vehicles		
Non-Exempt	25	Muni
Exempt	20	Muni
Exempt	5	RSD
Street Lights	200	Utility (excluded)
Traffic Lights	2	Muni
Water and Sewer		
Drinking Water Treatment Plant	1	Muni
Wastewater Treatment Plant	0	(regional)
Pumping Stations	10	Muni

C. ***Summary of Energy Use Baseline and Plans for Reductions*** – use sample Table 2 provided below

Table 2: Summary of Municipal Energy Use Baseline

BASELINE YEARFY20xx or CY20xx	MMBtu Used in Baseline Year	% of Total MMBtu Baseline Energy Consumption	Projected Planned MMBtu Savings	Savings as % of Total MMBtu Baseline Energy Consumption
Buildings				
Vehicles				
Street/Traffic Lights				
Water/Sewer/Pumping				
Open Space[3]				
Total		**100%**		

[3] A municipality can choose to attribute Open Space energy use to the other categories if desired. If open space is used as a category, please be sure to list exactly what is included as a footnote and that, if using MassEnergyInsight, it matches its Table 3.

III. ENERGY USE BASELINE INVENTORY

A. ***Identification of the Inventory Tool Used*** *(preferably MassEnergyInsight)*

B. ***Identification of the Baseline Year and ERP Timeframe*** *– Example: Our baseline year is FY2013. The five-year timeframe for the 20% energy reduction goal is FY2015-FY2019.*

C. ***Municipal Energy Consumption for the Baseline Year – please use one of the following options***:

- Using the embedded Excel Table 3 below (only works for Excel/Word 2007), provide one table with both native units (kWh, therms, etc.) and MMBtu

- Using the separately provided Excel version of Table 3, provide one table with both native units (kWh, therms, etc.) and MMBtu

- Insert tables reporting energy use in native units (kWh, therms, etc.) and MMBtu from MassEnergyInsight. Your MassEnergyInsight information MUST be complete, including uploaded oil, propane, gasoline, diesel and renewable fuels. Refer to MassEnergyInsight's Energy Reduction Plan Guidance Table 3 (Fuel Units) and Energy Reduction Plan Guidance Table 3 (MMBtu).

Provide an overall breakdown per individual building, water and sewer treatment plants, and open space facilities. An open space category may be used for any facility or location where the primary purpose of the facility is exposed space such as parks, cemeteries and athletic fields. Vehicles, streetlights, traffic lights and distribution and water/sewer distribution and collection pumping can be provided in the aggregate. Please insert additional columns for any other fuels and be sure to list their consumption in the correct units.

Fuel use from all vehicles, including those characterized as exempt AND non-exempt under Criterion 4, must be included. Diesel and gasoline must be listed separately.

<u>A Note About Renewable Energy</u>

Renewable Energy is a fuel source and the amount of renewable energy generated by the Green Community should be included here as a type of energy usage. Please report the amount of renewable electricity consumed by each building that is over and above any renewable electricity included in utility bills by loading that usage into MassEnergyInsight. For example, if a solar PV system on a high school results in an electricity bill reporting the use of 0 kWh, then load the actual kWh produced by the solar PV into MassEnergyInsight for each month.

For thermal Renewable Energy systems that do not have a flow meter to measure the actual amount of thermal energy generated, please report the projected thermal energy generation from the design study. See examples in italics below. Biomass and biofuels should be reported separately from other Renewable Energy types by reporting fuel consumption. Please do not include any Renewable Energy Certificates as these only displace the carbon emissions associated with energy generation, not the use of the energy.

Table 3: Municipal Energy Use Baseline *(Embedded Excel version, only works with Office 2007; a separate version is provided for Excel 97-03. To edit, double click within the table.)*[4]

	Electricity		Natural Gas		#2 Distillate Fuel Oil		Propane		Gasoline		Diesel		Renewable Energy - Electric		Renewable Energy - Thermal [1]		Total MMBtu
	kWh	MMBtu	Therms	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	Gallons	MMBtu	kWh	MMBtu	Gallons	MMBtu	
School		0		0		0		0		0		0		0			
Town Hall		0		0		0		0		0		0		0			
Police Station																	
Add Bldg																	
Add Bldg		0		0		0		0		0		0		0			
Subtotal for Buildings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
Drinking/Wastewater Treatment Plant(s)		0		0		0		0		0		0		0			
Pumping in Aggregate		0		0		0		0		0		0		0			
Open Space [2]		0		0		0		0		0		0		0			
Vehicles in Aggregate		0		0		0		0		0		0		0			
Street and Traffic Lights in Aggregate		0		0		0		0		0		0		0			
Total Energy Use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[4] 1 To convert thermal renewable energy generation to MMBtu, please multiply by the conversion factor for the displaced energy source. For example, for solar thermal replacing oil, multiply the gallons of oil that were not consumed by 0.139 MMBtu/gallon.

2 A municipality can choose to attribute open space energy use to the other categories if desired. If open space is used as a category, please be sure to list exactly what is included as a footnote and that, if using MassEnergyInsight, it matches MassEnergyInsight Table 3.

III. ENERGY REDUCTION PLAN

A. *Narrative Summary* –

1. *Overview of Goals for Years 1-3*
2. *Overview of Goals for Years 4-5*
3. *Identify Areas of Least Efficiency/Greatest Waste* – MassEnergyInsight's "Buildings to Target" view is helpful in identifying these areas

B. *Getting to a 20% Energy Use Reduction within the 5 Year Period Following the Baseline Year* –

NOTE: At a minimum, a municipality must identify specific measures with projected reductions to obtain a 15% reduction with supporting audits and/or calculations for these measures. A general strategy in the narrative section for identifying and obtaining the remaining 5% is acceptable. This section should include energy reductions anticipated from all divisions and departments including: all municipal buildings, school buildings (excluding Regional School Districts), municipal and school vehicles, street and traffic lighting, drinking water and wastewater treatment plants, pumping stations and open spaces owned by the municipality.

1. *Program Management Plan for Implementation, Monitoring and Oversight* – Identify the personnel responsible both for oversight of the Energy Reduction Plan implementation and for implementation of energy conservation measures in specific departments or buildings, if applicable. Also identify personnel responsible for the Annual Reporting requirements.

2. *Energy Conservation Measures* – In Table 4[5] in the separate excel file, list completed and planned energy conservation measures, including vehicular efficiency measures. **References for each measure must be included in the table and these references, including any calculations, must be included as appendices to the Energy Reduction Plan.** Refer to the sample table below, but please submit the excel file in your application.

For each measure, provide[6]:

- its status/projected timeline
- the projected energy savings in native units (kWh, gallons, therms, etc.)
- the projected cost savings
- the total cost
- any utility incentives received
- any planned use of Green Communities grant funds, if designated
- for measures requiring additional funding, the funding source: capital budget, operating budget, debt and type, or other grants

[5] If you are designated, Table 4 will be also be used for future Green Communities reporting, including applying for and final reporting on Green Communities designation grants and for annual reports.

[6] **Why Does DOER Want This Level of Detail?** This information will be used by DOER to:

- Confirm that a municipality has a well thought-out and documented pathway to fulfill its commitment to reduce its energy consumption by 20% in five years.
- Ensure that all Green Communities have met a similar level of review stringency in order to be designated.
- Provide information to the legislature and general public on the total and average projected energy savings, projected energy cost savings, greenhouse gas reductions, total capital costs, simple payback time, and financial support from the electric and gas utilities for the Green Communities program as a whole.
- Confirm that energy use reduction is from energy efficiency projects and initiatives. Because reporting of a building's total energy usage reflects both efficiency and renewable energy projects, a municipality needs to demonstrate that it has implemented enough energy efficiency to account for 20% of the total energy reduction in year 5.
- Analyze the relative effectiveness of project measures (i.e., heating upgrades, VFDs on pump stations, LED streetlights, use of biodiesel) to provide informed recommendations to additional municipalities.

- the source of the calculated energy and cost savings in the reference column; audits and/or calculations must be included in the Appendices.
- For fuel conversions, please include the projected energy savings of the old fuel AND the projected use of the new fuel as a negative energy savings (this will allow calculations of GHG reduction).

Acceptable References for Table 4 - All sources for projected energy savings for individual measures must be identified in Table 4 and supported with documentation. If any energy audits were completed, including an Investment Grade Audit conducted as part of an energy savings performance contract, please provide the entire audit as an attachment.

If creating an ERP without an audit, municipalities can analyze the energy baseline data for the least efficient buildings to identify appropriate Energy Conservation Measures based upon knowledge of the buildings and their equipment. If sources other than an audit are used for projected energy savings, please provide a brief summary of those sources here and include complete assumptions and calculations in the Appendices. Note that staff that are Building Operator Certified (BOC) have the credentials to perform these calculations. Alternatively, a municipality may use estimated energy savings from an accredited source, such as DOE or EPA, but must provide the complete assumptions and calculations in the Appendices. Please see the ERP from the Town of Warwick for an example.

Projected energy savings may be obtained by requesting information from equipment manufacturers. For example, if a building has an older boiler with an efficiency factor of 50% and the proposed new boiler has an efficiency factor of 90%, energy savings from the boiler can be estimated by multiplying 40% times the annual fuel use of the boiler. These calculations must be included in the Appendices.

PLEASE NOTE that the projected energy savings from a building in another municipality's Energy Reduction Plan cannot be used. In addition, the total projected energy savings in an audited municipal building generally cannot be applied to other municipal buildings. In order to be able to apply projected savings from one audited building to another unaudited building, the buildings must be similar in type and specific measures that are common to both must be identified with supporting details included to verify this type of estimation. Examples include last year of lighting retrofits, current boiler/furnace efficiencies and quotes for new boiler/efficiencies, R-values of insulation and calculations of potential savings. The building types and occupational profiles must be similar unless the measure is building-independent (such as vending machine energy controls).

3. *For Municipalities Taking Credit for Efficiency Measures Occurring Before Green Communities Designation Application* - (i.e. for towns with a baseline of FY2014, FY2015, CY2014 or CY2015) - Actual reductions in energy usage may be applied to the 15% in identified energy savings. For example, a municipality with a baseline year of FY2014 saw an energy reduction of 4% in FY2015. It would then need to identify an additional 11% in documented energy efficiency measures in Table 4, as well as an additional 5% in general efficiency strategies in the narrative.

   In order to claim credit for actual energy reductions, include in Table 4 all efficiency measures implemented during the period following the baseline year with estimated energy savings from each measure. Then demonstrate the actual energy reductions by providing a separate Table 3a for each year following the baseline year with the annual energy reductions for each building and for the municipality as a whole. (This is the same information that will eventually be asked of you in the Annual Reports as a designated Green Community.)

4. *For Municipalities Using a Performance Contract (Energy Management Services)* – If an Investment Grade Audit (IGA) has been performed, a municipality may provide the IGA report in lieu of Table 4 for those measures and buildings/facilities. If ≥ 15 percent reduction from the baseline energy use has not been identified, additional measures should be listed using Table 4.

Table 4: Energy Conservation Measures Data *(Embedded Excel version, only works with Office 2007; a separate version is provided for Excel 97-03)*[7]

ECMs			Status		Energy Data			
Category/Building Name	**Energy Conservation Measure Name**	**ECM Type (select one from drop-down)**	**Status (select one from drop-down)**	**Status Date (Completed with month/year or planned Qtr/year)**	**Projected Annual Electricity Savings (kWh)**	**Projected Annual Natural Gas Savings (therms)**	**Projected Annual Propane Savings (gallons)**	**Projected Annual Gasoline Savings (gallons)**
Green School	Lighting Retrofit	Interior Lighting	Complete	Feb-11	6,000	0	0	0
Town Hall	Air Sealing	Weatherization	Active	Dec-14	0	230	0	0
Town Hall	New Boiler	HVAC	Planned	Q3 2015	0	17,122	0	0
Street Lights	LED Conversion	Exterior Lighting	Active	Jan-15	95,252	0	0	0
Drinking Water Treatment Plant	2 Variable Speed Drives	Pump/Motor/Drive	Complete	Q3 2012	500,000	0	0	0
Vehicles	Anti-idling retrofit for 2 police cruisers	Vehicles	Complete	Q2 2014	0	0	400	400
		TOTAL Projected Savings			**601,252**	**17,352**	**660**	**660**
		TOTAL MMBtu SAVINGS	**4,791**		**2,051**	**2,412**	**82**	**82**

[7] 1 To convert thermal renewable energy generation to MMBtu, please multiply by the conversion factor for the displaced energy source. For example, for solar thermal replacing oil, multiply the gallons of oil that were not consumed by 0.139 MMBtu/gallon.

2 A municipality can choose to attribute open space energy use to the other categories if desired. If open space is used as a category, please be sure to list exactly what is included as a footnote and that, if using MassEnergyInsight, it matches MassEnergyInsight Table 3.

ECMs			Financial Data					Reference Data	
Category/Building Name	**Energy Conservation Measure Name**	**ECM Type (select one from drop-down)**	**Projected Annual Cost Savings ($)**	**Total Installed Cost ($)**	**Green Community Grant ($)**	**Utility Incentives ($)**	**Net Cost ($)**	**Funding Source(s) for Net Costs**	**Source for Projected Savings**
Green School	Lighting Retrofit	Interior Lighting	$8,000	$25,000	$0	$12,500	$12,500	Town Capital Plan FY2011	http://www.energystar.gov/ia/business/downloads/BP_Checklist.pdf
Town Hall	Air Sealing	Weatherization	$1,100	$3,500	$1,750	$1,750	$0	N/A	A-Z Energy Audit, 2008
Town Hall	New Boiler	HVAC	$5,000	$50,000	$35,000	$15,000	$0	N/A	Boilers-to-Go Quote, 2009
Street Lights	LED Conversion	Exterior Lighting	**$2,500**	$5,000	$0	$2,500	**$2,500**	Town Operating Budget FY2011	LED Signals Today Quote, 2009
Drinking Water Treatment Plant	2 Variable Speed Drives	Pump/Motor/ Drive	$40,000	$200,000	$0	$100,000	$100,000	Town Bond FY2012	Energy Masters Technical Study, 2010
Vehicles	Anti-idling retrofit for 2 police cruisers	Vehicles	$4,500	$6,000	$0	$0	$6,000	Town Operating Budget FY2012	green.autoblog.com
		TOTAL Projected Savings	**$61,100**	**$289,500**	**$36,750**	**$131,750**	**$121,000**		

C. ***Summary of Long-Term Energy Reduction Goals – Beyond 5 years***

1. *Municipal Buildings (including schools)*
2. *Vehicles (including schools)*
3. *Street and Traffic Lighting*
4. *Perpetuating Energy Efficiency* – Has the municipality considered an energy conservation savings reinvestment plan (in which some of the energy savings are reinvested into a fund to finance future energy efficiency or renewable efficiency measures)? Or has it identified a mechanism for directing some of the energy cost savings from an annual operating budget to reinvesting in further energy efficiency?

MMBtu Conversion Chart[8]

Fuel Energy Content of Common Fossil Fuels per DOE/EIA

BTU Content of Common Energy Units – (1 million Btu equals 1 MMBtu)

- 1 kilowatt hour of electricity = 0.003412 MMBtu
- 1 therm = 0.1 MMBtu
- 1 ccf (100 cubic foot) of natural gas = 0.1028 MMBtu (based on U.S. consumption, 2007)
- 1 gallon of heating oil = 0.139 MMBtu
- 1 gallon of propane = 0.091 MMBtu
- 1 cord of wood = 20 MMBtu
- 1 ton of wood pellets = 16.5 MMBtu
- 1 gallon of gasoline = 0.124 MMBtu (based on U.S. consumption, 2007)
- 1 gallon of E100 ethanol = 0.084 MMBtu
- 1 gallon of E85 ethanol = 0.095 MMBtu
- 1 gallon of diesel fuel = 0.139 MMBtu
- 1 gallon of B100 biodiesel = 0.129 MMBtu
- 1 gallon of B20 biodiesel = 0.136 MMBtu[9]
- 1 gallon of B10 biodiesel = 0.137 MMBtu[9]
- 1 gallon of B5 biodiesel = 0.138 MMBtu[9]
- 1 barrel of residual fuel oil = 6.287 MMBtu

FOR MORE INFORMATION

Website:

www.mass.gov/energy/greencommunities

[8] If a conversion factor for a fuel you use is not provided, please contact DOER.

[9] Calculated Values from those of diesel and B100 biodiesel

V. ONSITE RENEWABLE ENERGY PROJECTS & RENEWABLE ENERGY

Please note any plans for onsite municipal renewable energy projects during the 5-year period. Renewable energy projects cannot be used towards the 20% reduction in any instance. The purchase of Renewable Energy Certificates also cannot be used towards the 20% reduction in any instance. If renewable energy projects are planned, in process or completed, please include them in Table 5.

(Embedded Excel version, only works with Office 2007; a separate version is provided for Excel 97-03. Double-click within the table to edit.)[10]

Renewable Energy Measure		Status	Energy Data		Financial Data					Reference Data	
Location	Renewable Energy Project	Status (Completed with month/year or planned Qtr/year)	Projected Annual Electricity Generation (kWh)	Projected Thermal Generation/ Displaced (therms)	Total Project Cost ($)	Projected Annual Cost Savings ($)	Green Community Grant ($)	MassCEC & Other Grants ($)	Net Town Costs ($)	Funding Source(s) for Net Town Costs	Source for Projected Generation and Savings
Renewable Energy Projects Total		*N/A*	0	0	0	$0	$0	$0	$0	*N/A*	*N/A*
TOTAL MMBtu SAVINGS		0	0	0							

[10] 1 To convert thermal renewable energy generation to MMBtu, please multiply by the conversion factor for the displaced energy source. For example, for solar thermal replacing oil, multiply the gallons of oil that were not consumed by 0.139 MMBtu/gallon.

2 A municipality can choose to attribute open space energy use to the other categories if desired. If open space is used as a category, please be sure to list exactly what is included as a footnote and that, if using MassEnergyInsight, it matches MassEnergyInsight Table 3.

APPENDIX A – Sample Letters from Both General Government and School District Verifying Adoption of the ERP

General Government – The general government must provide a letter from the Chief Executive Officer of the city or town stating that it has adopted the Energy Reduction Plan. The Chief Executive Officer is defined as the manager in any city having a manager and in any town having a city form of government, the Mayor in any other city, and the Board of Selectmen in any other town unless some other officer or body is designated to perform the functions of a Chief Executive Officer under the provisions of a local charter or laws having the force of a charter.

On Town/City Letterhead

October 14, 2016

To Whom It May Concern:

Please be advised that on October 14, 2016, the Select board of the Town met at a duly noticed and regularly scheduled meeting and voted to adopt[11] the Energy Reduction Plan for Criterion 3 of the Green Communities Application for Designation. The Selectboard was given copies of the plan for review prior to the meeting.

The Selectboard voted unanimously to adopt the plan and the minutes of that meeting include the vote.

Sincerely,

[signature]

Selectboard Members and/or Chair, Mayor or Town Manager

On School District Letterhead

October 14, 2016

To Whom It May Concern:

Please be advised that the town/city/regional school district adopts the Energy Reduction Plan as part of the city/town's Green Communities Application for Designation.

Sincerely,

[signature]

School Superintendent

[11] The verbs "approve," "committed," or "adopt" are acceptable to indicate town/city and school board adoption of the ERP. The verbs "endorse" or "support" are NOT sufficient indications of town/city and school board adoption of the ERP.

APPENDIX B – Guidance for Inclusion of Regional School Districts in Energy Reduction Plan

- For a regional school districts (RSD) to be included as part of a municipality's Green Communities designation, the RSD must be included in the energy use baseline for the municipality and must adopt the energy reduction plan. For the RSD to be included in the municipality's energy use baseline, it must determine its individual energy use baseline and assign the appropriate percentage of that baseline to the municipality. The appropriate percentage is the funding assessment percentage that municipality contributes annually to the RSD.

- The energy use data for the RSD should be apportioned and included in the Municipality's Energy Reduction Plan as described below. Upon request, both the Municipality and the RSD should be able to provide the RSD's data prior to apportionment (i.e. the RSD's total energy use).

- A municipality may include its local elementary school that is part of a RSD, but not include its portion of the middle and/or high schools. In this case, 100% of the elementary school's energy use would be included in the Energy Reduction Plan. The apportionment instructions below do not apply. The accounts from an elementary school belonging to a RSD may be assigned in MassEnergyInsight to an individual municipality if desired.

Instructions to include RSD Energy Data in a Municipality's Energy Reduction Plan

- Include a paragraph in **IIA *Narrative Summary of the Municipality*** including a description of the RSD and the portion of its funding (as a percentage) that the municipality contributes.

- In **Table 1**, indicate the TOTAL number of buildings, vehicles, streetlights, and traffic lights owned by the RSD, with appropriate subcategories. These numbers should NOT be apportioned to the Municipality based upon the funding assessment percentage. See sample below:

Table 1: Summary of Municipal and RSD Energy Users

	Municipal Number	Ownership
Buildings		
Oil Heat	5	Muni
Oil Heat	3	RSD
Propane Heat	4	Muni
Vehicles		
Non-Exempt	25	Muni
Exempt	20	Muni
Exempt	5	RSD
Street Lights	200	Utility
Traffic Lights	2	Muni

- Include the RSD in the energy usage and projected reduction totals in **Table 2 *Summary of Energy Use Baseline and Plants for Reductions***. To calculate the appropriate amount to be included in the usage, multiply the total annual energy use of the RSD by the percentage of funding that the municipality contributes.

Example: Town Y's total annual energy use is 320,000. Town Y contributes 25% of the annual RSD funding. Its RSD's total annual energy use is 80,000 MMBtu. The portion of the RSD's energy use attributable to Town Y is 80,000 x 0.25 = 20,000 MMBtu. So Town Y's Total Energy Use, including its RSD portion, is 320,000 + 20,000 = 340,000 MMBtus.

- For **IIIC *Municipal Energy Consumption for the Baseline Year***, **Table 3**, please list the RSD as separate building(s) in their own rows and only include the portion attributable to the municipality based upon their funding assessment percentage. For vehicles and street and traffic lights, include as separate rows. For the energy consumption of the RSD's buildings vehicles and lighting, only include the portion attributable to the Municipality based upon their funding assessment percentage.

<u>Instructions to use MassEnergyInsight for energy use data</u>

- Both the municipality and the RSD must have authorized users, their accounts signed to specific buildings, and be actively entering oil, propane, and third-party purchased energy data.
- Calculations to assign energy use to the municipality from the RSD cannot be performed in MassEnergyInsight. The data must be exported and independently manipulated. However, as described above, these are simple multiplication and addition functions that can easily be done using a calculator or Excel.
- The accounts from an elementary school belonging to a RSD may be assigned in MassEnergyInsight to an individual municipality if desired.
- These data can be found in MassEnergyInsight's ERP Guidance Tables 3A (Native Units) and 3B (MMBtu).
- The RSD should provide its energy use data from MEI to the municipality for inclusion in the Green Communities Energy Reduction Plan.
- The municipality should include the RSD data in Tables 1, 2, and 3 as described above.

APPENDIX C - Guidance for Building Stock Changes

For changes in building stock (including renovations, additions, new construction, demolition, replacement or acquisition), **PLEASE CONSULT WITH DOER TO DETERMINE THE PROPER TREATMENT OF THEIR ENERGY USE IN THE FUTURE ANNUAL REPORTS.** In general, the guidance provided in the table below will be followed. However, due to the unique nature of many building projects, a community MUST consult with DOER regarding building stock changes prior to submission of its Green Communities application. Please contact your Regional Coordinator to initiate this conversation.

Table: Building Stock Changes Summary Guidance

	Building Energy Use Included in Energy Consumption?	**How to Report?**
Retrofit/Renovation	Yes	Annual report
Addition	Yes, pro-rated by square footage	Annual report
New Construction	No	Separate monitoring
Removal/Demolition	No, subtract from baseline	Annual report
Replacement of an Existing Building	Yes	Annual report
Acquisition of an Existing Building	Only if desired	Separate monitoring or add to baseline in annual report

- **Retrofit/Renovations:** Retrofits and Renovations will be factored into the 20% reduction and do not alter the energy use baseline. This is not additional space and renovations should be done such that the space becomes more efficient.

- **Additions:** The energy load for that building and its addition will be counted towards the 20% reduction target but will be pro-rated based on the building square footage. For example, if a 1000 sq foot building added 300 sq feet (an additional 30%), then 70% of the energy bills for the building would be accounted for in monitoring the community's progress towards meeting its 20% energy reduction target.

- **New Construction:** The additional energy load from these buildings will NOT be added into the energy use baseline and therefore the additional load will NOT be factored into the 20% reduction target. However, a municipality will be expected to monitor the performance of this building, using MassEnergyInsight or another tool, under its annual Green Communities reporting to verify that it is performing as designed and modeled. If it is not, a corrective action plan must be developed and implemented to correct the building's performance.

- **Removal/Demolition:** For buildings that are removed from the building stock, the energy use baseline will be adjusted to subtract that building and the 20% reduction target will be revised accordingly. This will occur if they are not replaced by a new building (see below).

- **Replacement of an Existing Building:** For buildings originally included in the baseline that go offline and are replaced by a new building, the energy use baseline will not change and the new building will be included in the 20% reduction target. If the new building is larger than the replaced building, then the energy use will be apportioned according to the difference in their square footages. For example, , if a 1000 sq foot building was replaced with a 1500 sq feet (an additional 33%), then 67% of the energy bills for the building would be accounted for in monitoring the community's progress towards meeting its 20% energy reduction target.

- **Acquisition of an Existing Building:** If a municipality acquires an old building (i.e., not new construction) after the baseline year, and that building is not replacing a building already included in the baseline, the additional load from

such a building will not be required to be included in the consumption profile and therefore the additional load will not be factored into the 20% reduction target. HOWEVER, one of the following two should occur:

- At a minimum, as part of the Green Communities application Energy Reduction Plan (ERP), the municipality should address these buildings separately, noting what their baseline energy use was when they were acquired and what measures are planned for their improved energy performance.

- As an alternative, if a municipality so chooses, it can add the load from these buildings into the energy use baseline when they were acquired and include them in the 20% reduction target. (A municipality may choose to do this because it may provide a better opportunity for them to achieve the 20% reduction target). A municipality choosing to do this must provide an explanation in its ERP.

- **Petition to Modify Energy Use Baseline:** At any time, a municipality can petition DOER to consider modification of its baseline. For example, a municipality may replace an existing smaller school with a new school that is significantly larger, with a pool added, etc, and it may wish to adjust its baseline to take this added square footage and energy use data into consideration. DOER reserves the right to approve or deny any such petition.

- **For a municipality NOT using the most recent year as the baseline year:** If building additions or acquisitions occurred after the baseline year BUT prior to submitting its application for Green Communities Designation, a separate monitoring plan must be included in the ERP to address their energy efficiency. These buildings will NOT be added into the consumption profile and therefore the additional load will not be factored into the 20% reduction target. HOWEVER, the municipality should note in the ERP how these buildings were constructed or retrofit to be as energy efficient as possible and the intended energy performance as designed. The ERP must include a separate monitoring program for these buildings to ensure that they are performing as designed and modeled and, if they are not, the municipality must include a plan for corrective actions.